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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE • June 3, 1944

New Atom Smasher

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A SCIENCE SERVICE PUBLICATION

MEDICINE

Gelatin Fights Shock

Solutions which can safely be injected have a definite, though temporary, effect in cases of burns and hemorrhage, study shows.

➤ GELATIN solutions which can safely be injected into human veins and which have a definite, though temporary, effect in fighting shock from hemorrhage and burns have been developed and have undergone extensive study by a subcommittee on blood substitutes of the National Research Council, it was announced with the release of a technical report by the committee under the chairmanship of Dr. Robert Loeb, Presbyterian Hospital, New York.

"The preparation and use of gelatin in no way decreases the need for the procurement of blood by the American Red Cross and the preparation from it of blood substitutes for the armed forces," the committee emphasizes.

"When available, whole blood, plasma or human serum albumin are the solutions of choice to be employed in the treatment of hemorrhage or shock," the statement continues.

Use of gelatin solutions has not yet been approved for the armed forces, and from the committee report it appears that one reason may be the fact that the solutions gel at about 68 degrees Fahrenheit and therefore cannot be used in cool or temperate climates in the field.

The gelatin solutions studied, the committee reports, have a definite effect in augmenting the heart output and the volume of circulating blood in dogs and human patients suffering from shock after hemorrhage or skeletal injury, such, presumably, as broken legs or arms. Evidence of a beneficial effect of the solutions in burns also exists.

The solutions probably do not add much in the way of nourishment, their only place in treatment, the committee states, being to restore a loss of circulating blood volume in acute injury.

Whether the solutions will impair the return of normal function to kidneys in case of sustained lack of blood due to contraction of blood vessels supplying these organs or in the case of severe burns or the crush syndrome are among questions to be answered by further studies.

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MEDICINE

Dysentery Vaccine

New substance promises to be effective against many different strains of bacilli. Field trials needed to determine practical usefulness.

➤ A NEW SUBSTANCE for vaccinating humans against dysentery, often a disabling plague of armies in the field, is announced by Dr. Walther F. Goebel, Dr. Ely Pearlman and Dr. Francis Binkley, of the Hospital of the Rockefeller Institute for Medical Research. (*Science*, May 19)

Chief advantage of the new vaccine is the fact that it promises to be effective against many different strains of bacilli that cause dysentery. It is a very potent substance but also highly toxic. Because it is so potent, however, it can be given in doses so small that toxic reactions do not result.

A group of 20 volunteers have been vaccinated with the new material. Little or no sickness resulted although all the volunteers had swelling, redness and tenderness for 24 to 36 hours at the site of the injection. Tests showed that after vaccination, and in some cases six months after, the vaccinated persons still had antibodies in their blood to fight invading dysentery bacilli. Whether these antibodies are developed in sufficient quantity to protect against an attack of dysentery must await trials in the field.

That such trials will be made, to determine whether this new vaccine can be used to protect our fighting forces who may be threatened by dysentery, is suggested by the fact that the work leading to development of the vaccine was done under contract recommended by the Committee on Medical Research, between the Office of Scientific Research and Development and the Rockefeller Institute.

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AGRICULTURE

Oil-Producing Crops Recommended in Southwest

➤ NEW oil-producing crops for the Southwest, to replace vegetable oils formerly imported, were recommended to the First Southwest Regional Chemurgic Clinic meeting in Oklahoma City by Dr. C. L. Lundell, director of the Research Institute of Technology and Plant Industry of Southern Methodist University.

The familiar vegetable, okra, has a high-quality oil in its numerous seeds; Dr. Lundell believes that this plant might profitably be cultivated as an oil source. He also recommended expansion of the present acreage in safflower and castor bean, to replace some of the low-grade cotton now produced in excess in the South.

More than half a million acres of Southwestern land is suitable for the growing of cork-oaks, Dr. Giles B. Cooke of the Crown Cork and Seal Company reported. He has hopes of seeing the development of an American cork industry, so that no possible future emergency could put this country into the embarrassing situation produced by the Nazi-Vichy domination of European and North African cork-growing regions, which was broken only by the Tunisian campaign.

The Navy is now using rayon for pump packing, Miss Louise Whitney of the American Viscose Corporation reported. Other jobs which the war has given to rayon include use in the walls of self-sealing fuel tanks, parachute canopies, and the smaller chutes used in slowing the fall of fragmentation bombs.

Organization of the Southwest Chemurgic Council, representing eight states in the region, was announced at the meeting. Among the tasks it has already undertaken is a five-year research program to develop coal markets and create coal-consuming equipment of higher efficiency, particularly in the field of smokeless furnaces. The Council is also seeking for a feasible method for cooling homes in summer, using the energy obtained from burning coal.

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PHYSICS

Giant Cyclotron

A new 15,000,000-electron-volt atom-smasher has been put into operation at the Carnegie Institution of Washington. It is one of the two largest such machines in world.

See Front Cover

➤ SCIENCE has a new tool with which to probe the mysteries of the atom. It is a new giant cyclotron, or atom-smasher, just put into operation a the Department of Terrestrial Magnetism of the Carnegie Institution of Washington.

The new cyclotron is one of the two largest in operation in the world, the other being at Berkeley, Calif. It generates atom-smashing projectiles of 15,000,000 electron volts energy, permitting the most precise measurements ever made of the forces released by atomic disintegration.

The cyclotron itself weighs more than 225 tons, has an overall height of 12 feet, is 30 feet long and 20 feet wide. It took four years to build, at a total cost of $500,000 for the cyclotron, its appurtenances, and the special three-story building housing the equipment and instrument shop.

The magnet is made up of four iron castings, the largest weighing more than 50 tons.

Surrounded by this heavy magnet is the accelerating chamber, about 60 inches in diameter, in which atomic particles are accelerated.

In this accelerating chamber, the atomic particles receive successive "kicks" which cause them to whirl around in continually widening circles at tremendous speeds, until finally they reach a window on the side of the chamber, where scientists place any element they wish to bombard. Here the element receives the full force of the atom-smashing beam of atomic particles.

The Carnegie cyclotron is housed ten feet beneath the earth's surface, to prevent the radiation from reaching people outside. Mice, exposed to cyclotron radiations, of much less intensity than those created by the new atom-smasher, died in a few hours.

The new cyclotron, patterned along the same lines as 20 other similar instruments in the United States, is operated by Dean B. Cowie, physicist in charge of the cyclotron. He sits at the control board, a huge organ-like console, many yards away from the cyclotron itself, and protected from its radiations by specially constructed insulating walls. Before him are seven main switches, over 100 smaller switches, and a maze of dials and meters. Only by pressing the right switches, in the right order, can he make the cyclotron operate. This interlocking system of controlled operation protects the equipment from accidentally being damaged by mistakes in operation, or by failure of any component.

Because of the dangerous radiations, and the high-voltage equipment in the cyclotron laboratory, no one ever sees the cyclotron in operation. To prevent accidents, should anyone be in the laboratory while the power is on, master switches on doors leading to the powerful high-voltage parts of the laboratory automatically cut off all power when these doors are opened.

The Carnegie cyclotron, with its 100 kilowatt radio frequency supply, operates at a frequency of 10 megacycles which changes the polarity of the electrodes 10 million times a second.

Mr. Cowie said, "The results of experiments conducted in the fields of chemistry, biology, physics and metallurgy with the cyclotron will be of great value in molding a better post-war world.

The cyclotron was the invention of Prof. E. O. Lawrence, of the University of California, who received the Nobel Prize for its development. At the present time he is working on a cyclotron, more than three times greater than the 60-inch instrument.

Dr. M. A. Tuve, Dr. L. R. Hafstad, Dr. R. B. Roberts, Dr. G. K. Green, and Dr. P. A. Abelson of the Department of Terrestrial Magnetism integrated past experiences at other laboratories in this country, with improvements. Since the war Mr. Cowie has carried the responsibility of completion of the cyclotron.

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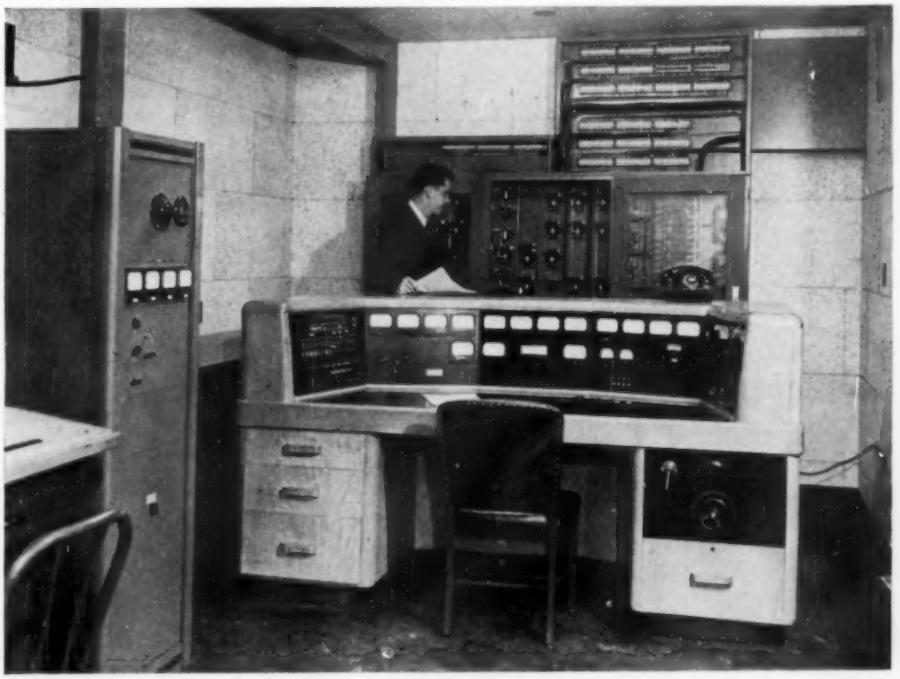

CONTROLS—This great array of controls, presided over by Dean B. Cowie, Carnegie Institution of Washington, operates the mechanism for shattering the tiny atom.

PUBLIC HEALTH

Trapping Germs With Oil May Reduce Infections

➤ SATISFACTORY results in tests of a method of trapping germs in oil to cut down the spread of sore throats, colds, and other respiratory diseases in bar-

racks and hospitals were announced by the War Department.

The method consists in giving an odorless, greaseless, non-sticky oil treatment to floors, blankets and bedding. The oil is applied to the floors by mopping, while blankets and bed linen get it in a final rinse in the laundry where the oil is applied as a whitish emulsion containing mineral oil and oleic acid among its ingredients.

Nose, throat and lung infections can be reduced 28% by keeping barrack floors oiled and soldiers' blankets impregnated with the invisible film, tests at Camp Carson, Utah, and neighboring Peterson Field showed.

In hospital wards, oiling the floors cuts the number of bacteria floating in the air from 460 to 120 per cubic foot of air. When bed linen is oiled in addition, the number of bacteria are cut from 3,500 to 350 per cubic foot of air. With both floors and blankets oiled, 97.2% of the bacteria were trapped on the oil film.

Blankets gain 1% to 2% in weight and also something in warmth from the treatment without additional fire hazard.

The tests were conducted by the Commission on Air-Borne Infections, under the chairmanship of Dr. Oswald H. Robertson, University of Chicago. This commission is one of 10 such which, with the Board for the Investigation and Control of Influenza and Other Epidemic Diseases with Dr. Francis G. Blake of Yale as president, function under the direction of the Preventive Medical Service of the Office of the Surgeon General.

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POPULATION

U.S.S.R. Growing Fast

Estimate indicates that two fifths of all the people of Europe and Soviet Union in 1970 will be living in pre-war U.S.S.R.

➤ About two fifths of the people of Europe and the Soviet Union in 1970 will be living within the borders of pre-war U.S.S.R.

The number of people living within the January, 1939, borders would be expected to reach about 250,000,000 by the year 1970 if war losses or boundary changes were not considered. The estimated population for all other European areas combined, without regard to war losses or boundary changes, is 392,000,000 persons, Dr. Frank Lorimer, professor of population studies at American University, reports. (*American Sociological Review*, June)

About 77,200,000 more people will probably be living within the U.S.S.R. borders at the end of 25 or 26 years than are there now. On the other hand, the combined population of northwestern and central Europe, including the British Isles, France, Germany, Austria, Hungary, Czechoslovakia, the low countries and Scandinavia, during the same period will most likely decrease by 8,000,000, Dr. Lorimer estimates.

"The Soviet Union will be characterized in the immediate future by a rapidly growing and predominantly young population," Dr. Lorimer reports. At the beginning of this decade almost half the people were under 20 years of age.

There are more women than men at present. For every 100 women between the ages of 20 to 45, there were only 90 men in 1940. Should war losses be considered, the number of men for each hundred women would be even lower. It will probably take 25 years for the ideal balance of an equal number of men and women to be restored.

Large numbers of people are migrating eastward. This movement, comparable to our adventurous westward movement during the early years of the nation, has been accelerated by the war. But the movement from the country into the city has been even greater. Together these represent a shift from a loosely coordinated, predominantly agrarian country to a diverse, well-balanced domain.

This transition, which would result in a fuller development of the U.S.S.R.'s potential resources, had only begun when interrupted by the war, reports Dr. Lorimer who conducted his population studies under the office of population research at Princeton University.

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ENGINEERING

Droppable Fuel Tank Increases Planes' Range

➤ A NEW droppable fuel tank that can be used to increase the operational range of flying boats by 60% with no appreciable effect on performance characteristics other than a 2% reduction in top speed was announced by the Glenn L. Martin Company of Baltimore.

The new Martin fuel tanks, designed by John D. Pierson of the engineering department, are made in three sections to facilitate handling and attachment. There are two tanks to a flying boat,

SCIENCE NEWS LETTER
Vol. 45 JUNE 3, 1944 No. 23

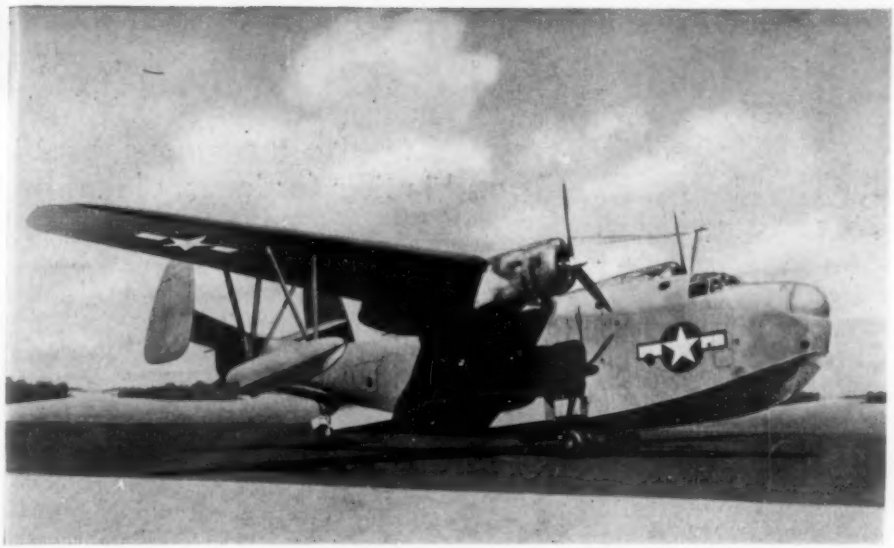
The weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N St., N. W., Washington 6, D. C. NOrth 2255. Edited by WATSON DAVIS.

Subscriptions—$5.00 a year; two years, $8.00; 15 cents a copy. Back numbers more than six months old, if still available, 25 cents.

Entered as second class matter at the postoffice at Washington, D. C., under the Act of March 3, 1879. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and in the Engineering Index.

The New York Museum of Science and Industry has elected SCIENCE NEWS LETTER as its official publication to be received by its members.

Member Audit Bureau of Circulation, Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C., PEnnsylvania 6-5566; and 360 N. Michigan Ave., Chicago, STAte 4439.



DROPPABLE—The two rear sections of the new Martin fuel tank, visible in this picture just above the wheels, can be attached to a flying boat while it is still on its beaching gear. After the fuel in the tanks has been consumed, or in case of an emergency, the tanks can be jettisoned.

one at either side of the hull. The forward sections are attached at the point where the beaching gear is normally affixed, with the remaining portions extending back to a point somewhat aft of the main step. The tanks are so designed that their bottoms form an extension of the bottom of the hull.

They are attached to the sides of the hull mechanically and can be released by a manual operation, or by an automatic gas bottle mechanism which drops the tanks as soon as the fuel they contain is consumed. Either one or both tanks can be dropped in case of an engine failure or other emergency which makes a reduction in weight desirable.

A further advantage offered by the sectional design of these tanks is that it permits the aft and center sections to be attached and fueled while the flying boat is up on its beaching gear on dry land, thus eliminating the necessity of fueling in the water for all but the two forward sections.

Martin engineers are convinced that these new fuel tanks, now being used only with the Martin PBM-3 Mariner, will play an important part in post-war commercial operations, since they will permit a greatly increased operational range with a minimum sacrifice of payload, and also can be used to allow greater payloads over shorter distances by enabling the operators to transfer part of the fuel load now carried inside the hull to the new tanks.

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PSYCHIATRY

Psychiatric Tests Needed

Study of Naval reserve officers receiving treatment for mental disease reveals importance of screening for officer candidates.

➤ YOU CANNOT get into the Navy as an ordinary seaman without passing a strict psychiatric examination to insure that you do not have any mental disease. But officer candidates, although they are subjected to investigations that may take months, receive no similar psychiatric testing.

The results of this are revealed in a report to the American Psychiatric Association by Lieut. Comdr. Z. M. Lebensohn, (M.C.) USNR. This paper, not widely heralded when it was given at the meeting, is undoubtedly receiving very careful attention by high ranking Navy medical officers. It is based on a study of a number of Naval Reserve officers treated for mental illness at St. Elizabeths Hospital, Washington, D. C.

Mental disease, Dr. Lebensohn pointed out, is no respecter of rank, and when it develops in an officer on active duty, the consequences may be very grave.

Of the officers studied by Dr. Lebensohn, most could have been detected by even a brief psychiatric investigation, he found. A surprisingly high number had been hospitalized for mental illness or had had prolonged neuropsychiatric treatment before they applied for commissions.

Not one had broken during combat, and only a few had ever actually been under fire.

One officer had collected from the Navy a pay check for $1,113.90 although he was on active duty for only five days before he had to go to a hospital for an acute mental illness. This man had had several years of unsuccessful psychoanalytic treatment for a severe personality disorder and had applied for a Naval commission in order to ecape the draft, Dr. Lebensohn found.

Others have, however, given good service to the Navy. Despite the fact that they were already ill with the early stages of a serious mental disease, two officers in command of vessels distinguished themselves so well in combat that they received citations. One of them was so deep in a self-depreciating depression that he refused to believe the citation was for him.

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MEDICINE

Gas Gangrene Diagnosis Speeded by New Test

➤ A NEW test which should speed diagnosis of gas gangrene, making it possible for the physician to tell in less than 24 hours whether one kind of germ that can cause this condition is present in the wound, is announced by Dr. F. P. O. Nagler, of the Royal Melbourne Hospital, Victoria, Australia. (*Nature,* April 22)

The test is for the organism, Clostridium oedematiens, said to have been isolated from war wounds in about 40% of the cases. Although it is important in gas gangrene infections to determine the infecting organism as quickly as possible, there has hitherto been no satisfactory method for rapid recognition of this particular germ.

When this germ is grown on a special

agar preparation to which sheep's blood and egg yolk suspension have been added, an opaque film with a mother-of-pearl luster forms over the germ colonies and over a hemolytic zone around them. Outside this a dark red "reduction" zone forms. No other species of Clostridium forms both the pearly layer and the red reduction zone.

Use of this diagnostic test method, although limited so far to five cases, suggests, Dr. Nagler reports, that it will be possible by its use to detect Clostridium oedematiens type A in material from wounds in which there are other germs.

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ASTRONOMY

Bright Single Stars Should Be Studied

➤ SOME of the brighter single stars should be studied spectroscopically to see whether they show any variation of motion which might reveal invisible companions small enough to be classed as planets, believes Dr. F. J. Neubauer, associate astronomer of the University of California's Lick Observatory, who is now stationed on the Los Angeles campus of the university.

Dr. Neubauer recently announced the discovery of a dark third body in the twin-star system of Beta Corona Borealis, which is now high in the evening sky. Although the star appears to the eye as a single stellar body, it was announced early in the century to be a twin system in which there is an invisible companion.

Studying the star with a spectrograph for 11 years, the period of one complete cycle, Dr. Neubauer discovered an additional irregularity of motion which indicated the presence of the third body. It is not as yet known about which star the "planet" travels. In size, it is believed to be only one-hundredth as large as the visible star.

The first single star discovered to have an invisible dark companion circling around it was the inconspicuous Cincinnati 1244, anouncement of the existence of the companion body having been made a little over a year ago. But many other stars which we now believe to be single may be accompanied by bodies which are so dark that they shine by reflected light and so may be called planets. Such stellar companions may be found by spectroscopic means or by studying the star's apparent path across the sky.

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ENGINEERING

Tire Cord Given "Wave"

Electronic heat is used to give a permanent set to the twist in rayon cord, used in tires for jeeps, planes and other war vehicles.

➤ ELECTRONIC heating is the newest development in making the rayon tire cord that adds strength and safety to tires for all kinds of American war materiel, from jeeps to super-bombers. Equipment for this process has recently been installed at the tire-cord plants of the Industrial Rayon Corporation in Cleveland, Ohio. Tests have now been going on long enough to assure uniform and satisfactory results.

Getting a twisted fiber to stay twisted has always been a problem, in all kinds of textiles. It is aggravated when the material is tough and springy, as rayon cord is. Heating is an accepted method (just as it is for human hair, in beauty shops); but the necessity for applying the heat with complete uniformity to all parts of a cord that may be a mile or so long imposes an additional problem.

The electron heating method was adopted because it was found that the big, 18-pound conical spools of cord heated uniformly from outside to core when placed in a high-frequency field. A few minutes' exposure suffices, so that the cones, wrapped in stout moisture-proof paper, can be marched through the apparatus on a conveyor belt, making the process a continuous one.

This newest step is simply an additional one in a "revolutionary evolution" wrought in the preparation of tire cord by Industrial Rayon. The established method of producing rayon called for winding up the fiber on a spool at practically every step in the process. Then it would have to be unreeled for each of the several chemical conditioning and finishing baths through which rayon has to pass, and wound anew on another

TWISTING—Production of tire cord requires two twisting operations. This is the second step, in which twisted threads from two bobbins are cable twisted into finished cord. This photograph was made at the plant of the Industrial Rayon Corporation.

PERMANENT SET—With this electronic heating equipment, 18-pound cones of rayon tire cord are treated in a high frequency electrical field to make its twist lasting.

spool before the next step. Obviously, this method becomes very time-consuming.

In the Industrial Rayon plants the fiber goes through ten stages in its processing, from the first drawing out of the viscid strands from the spin bath to the final winding on the bobbins that are racked on a truck to take it away. The fiber passes down a kind of cascade of successive reels, at each stage receiving one of the necessary chemical or physical treatments. Tremendous time-saving, as well as greater uniformity in final product, has been effected by this method.

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GENETICS

New Fame For Mendel

Pioneer of modern genetics shown by old letter to have been first to demonstrate that seed is formed by action of single pollen grain on single egg cell.

➤ GREGOR MENDEL, the Austrian monk-scientist whose experiments with garden peas laid the foundation of the whole modern science of genetics and present-day plant and animal breeding, is responsible also for another basic biological discovery which everybody nowadays takes for granted but which in his time was anything but clear. The story of this discovery, of the fact that one male reproductive cell, and only one, accomplishes the fertilization of the female or egg cell in starting a new life, is told by Dr. Tage U. H. Ellinger of the graduate school of the U. S. Department of Agriculture. (*Science*, May 12)

Seventy-five years ago, states Dr. Ellinger, the most eminent biologists believed that several male cells were necessary for the fertilization of each egg cell, whether in plants or animals. Charles Darwin himself, then at the height of his fame, supported this view, and cited results of experiments which were held to demonstrate it.

Briefly, they consisted in fertilizing four-o'-clock flowers with varying numbers of pollen grains. Those receiving only one grain each failed to produce seed, for the most part, while those receiving more than one grain were more successful.

Mendel, despite eye trouble which had forced him to give up his now classic hybridization experiments, repeated these experiments very critically, using the same plant species. The result, he stated in a letter to his friend, the biologist Carl Naegeli, "is an entirely different one." And he supports his conclusions, vitally important to the validity of his genetical research, with clean-cut scientific reasoning.

"I obtained," Mendel continues, "from fertilization with single pollen-grains eighteen well-developed seeds and from them as many plants, ten of which are already in bloom. The majority of these plants are just as fully developed as those derived from free self-pollination.

"A few specimens, however, have until now lagged somewhat in growth, but to judge from the success of the others, the reason can only be found in the circumstance that all pollen-grains do not possess the same faculty to fertilize; and, furthermore, that in these particular experiments the competition of other pollen-grains was excluded. Where several compete, we may assume that always the strongest succeeds in alone effectuating the fertilization."

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METALLURGY

Swiss Rolling Process Successful for Magnesium

➤ A NEW industrial process, a method for rolling sheets of magnesium and its alloys, presented by a Swiss inventor, Julius Zueblin of Glarisegg, was awarded a United States patent, 2,349,395.

Lubricants used in rolling most metals are useless in handling the chemically more active magnesium, it was discovered quite early in the development of magnesium metallurgy. Dry rolling was marked by an annoying flaking off of the surface, necessitating constant brushing and polishing of both sheets and working rollers. The new process substitutes for the conventional lubricants one of a number of resin-like substances, such as tar-oil, anthracene oil, etc. The surface layer thus formed also protects the magnesium during subsequent processing and storage.

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ENGINEERING

Jet Cooling of Pistons Recommended for Planes

➤ JET COOLING of pistons has been recommended as a promising method of combating excessive combustion temperatures which have hampered progress toward increasing power output and reducing weight in marine and aircraft engines.

G. Flynn, Jr., and A. F. Underwood, General Motors Corporation, at the Society of Automotive Engineers meeting in Chicago, reported satisfactory service tests with jet-cooled steel pistons in marine diesels and laboratory experiments with jet-cooled aluminum pistons in aircraft engines.

Temperature of an all-welded steel piston was controlled by directing a jet of lubricating oil at the underside of the piston, using about one-half gallon of oil a minute. Jet cooling might permit using all-welded steel alloy in place of aluminum pistons in aircraft engines to assure adequate piston strength at all temperatures, and eliminate traditional difficulties with sticking rings, blow-by, and excessive wear and oil consumption at high speeds.

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CHEMISTRY

Glass Plastic Sandwiches Provide New Material

➤ NEW glass-plastic sandwiches, laminated sheets of glass and plastic, are now being used to fabricate fuselage and tail sections of airplanes. When it is no longer restricted to military use, the new structural material will be available for such civilian products as lightweight luggage, molded office and home furniture, prefabricated kitchen and bath units. The new material was developed by the Army Air Forces.

The new material, which is a combination of glass fibers and special plastic resins, is stronger, weight for weight, than metals. It can be formed into large, intricate shapes at low pressure without the use of costly molds.

Work on the new glass-plastic material was carried on by Owens-Corning Fiberglas Corporation and seven plastics manufacturers under the supervision of Col. Paul H. Kemmer of the aircraft laboratory at Wright Field.

AAF engineers have found the new material to be 50% stronger than aluminum, and 80% stronger than wood in strength-weight tests.

It is possible that the glass-plastic material may also be used in automobile, bus and trailer bodies, and railway cars. Research and development work on possible applications is now being conducted in many industrial laboratories.

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SAFETY

Taking Particle From Eye Hazardous for Amateurs

➤ ONE out of every ten eye accidents can be blamed on attempts of amateurs to remove a particle lodged in the eye. More than half of the people forced to wear artificial eyes were victims of accidents, it was revealed in a survey on artificial eye wearers recently completed in nine major cities by Paul Gougelman, artificial eye manufacturer, in cooperation with the Greater Chicago Safety Council.

Flying chip of wood caused 15% of all eye injuries. Falls around the home, and careless use of scissors, wire, nails and hammers accounted for a large number.

On the-job accidents, where pieces of steel entered the eyeball, accounted for one out of every seven eye injuries. The number of eye accidents in industry, however, is sharply decreasing with the use of modern safety devices such as goggles, safety masks and helmets.

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METALLURGY

Stainless Steel Kiln For Mercury Extraction

➤ MERCURY, necessary alike in medicine and munitions, may be more readily and economically extracted from its most common ore, cinnabar, by means of a new kind of rotary kiln on which patent 2,348,673 was granted to Charles F. Degner of Chicago.

Simply heating cinnabar drives the mercury off as a vapor, which condenses to a liquid in a cooler part of the furnace, and so can be collected. Furnaces of older, cruder materials, such as brick and iron, presented difficulties: mercury soaked into the porous brick, and acids associated with the distillation corroded the iron. Mr. Degner substitutes acid-proof stainless steel in his kiln, which also makes possible a continuous-flow production instead of the intermittent batch methods necessary with the old furnaces.

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IN SCIEN

ECONOMICS

Clothing Standards Lower Than Is Diet in Europe

➤ CLOTHING standards in Europe have declined much more drastically during the war than have dietary levels. During the winter of 1943-44, cold probably caused as much suffering and as many deaths as did hunger, states a report from the Special Project on Relief and Rehabilitation of the National Planning Association.

About one-third of the United States' total contribution for relief and rehabilitation, the report estimates, should be spent for clothing supplies. Our total contribution would be about what we spend on the war every five days, or $1,350,000,000.

The bulk of clothing must be supplied from the United States, it is believed. The total European requirement for cotton textile production equals just under 5% of one year's production. If we maintain wartime production, we can spare 200,000,000 yards of wool to Europe without restricting civilian consumption, the committee estimates.

The shortage in clothing is believed to be so acute that cotton and wool must be imported during the relief period in sufficient quantities to provide at least one-third of Europe's 400,000,000 people with a whole new outfit.

The shortage of shoes is even more marked than that of textiles. Probably for every person who needs a new suit, there are two who need shoes.

Before the war, continental Europe, exclusive of the neutrals, produced only about 46% of the fiber consumed there; the rest was imported. Thus the stoppage of imports by the war has had a devastating effect on the continent's supply of textiles. Civilian consumption of textiles is now about three pounds per year for each person, or only enough to make one child's mackinaw.

The rehabilitation program should call for not only sending finished garments immediately, but sending piece-goods so that the Europeans themselves can make their own garments, and sending raw cotton and wool to enable the European textile mills to supply the Continent's needs for finished products.

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NCE FIELDS

NUTRITION

Antivitamin May Be Used To Promote Human Health

➤ USE of a vitamin-inhibiting substance, or antivitamin, to promote human health sounds a bit paradoxical at first blush—we have become so used to the idea of all vitamins being beneficial. However, one vitamin, pantothenic acid, has been shown to be necessary for the growth of certain bacteria, but has not yet been proven necessary for human life.

Hence, reasons E. E. Snell of Austin, Texas, cutting off the supply of pantothenic acid from the bacteria may produce a bacteriostatic effect, similar to that of the sulfa drugs. In his patent, No. 2,348,425, he describes a method for producing an antivitamin that prevents the vitamin from helping the bacteria to grow. Rights in the patent are assigned to the Research Corporation of New York.

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PHYSICS

Cyclograph Saves Time In Testing Metals

➤ THE CYCLOGRAPH, a new electronic tool that easily and quickly determines whether a piece of metal meets hardness specifications, without the use of expensive, time-consuming chemical tests, was outlined at the meeting of the Institute of Radio Engineers by E. R. Mann of the Allen B. DuMont Laboratories. The problem of sorting metal that meets production requirements from metal that does not, wastes much valuable time in war plants, he said. The cyclograph does in a matter of seconds a test that used to take hours to complete.

The new instrument operates by the comparison method. A piece of metal of known type and hardness is first dropped into a small magnetic coil attached to the cyclograph. A reading is made on two cathode-ray screens. Using this reading as a guide, any number of pieces of metal can be inserted into the coil and checked with the instrument.

In cases where the kind and hardness of metal are not known, it can be identified by placing it in the coil, taking a reading and referring to specially designed charts.

In steel mills, the cyclograph is set up near the furnaces. Samples taken from the furnaces, while the metal is cooking, tell whether the final product will meet the standards set up for it.

In war production plants, the cyclograph, used on the production line, eliminates shell cases that are too soft, and which, if fired, would ruin the gun.

"Further research," Dr. Mann said, "will uncover many new uses for the cyclograph in peacetime production."

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BIOLOGY

Science Medal Sent To Widow of Zoologist

➤ POSTHUMOUS presentation of science honors which were not posthumously awarded is the unusual circumstance attending this year's granting of the Leidy Medal, high honor in biological science, by the Academy of Natural Sciences of Philadelphia.

The award was voted some time ago to Dr. Chancey Juday of the University of Wisconsin, in recognition of his eminence in the field of fresh-water biology. He was duly notified of the committee's action. During April, before the medal could actually be presented, Dr. Juday died. So now the medal, last of his many honors, has been sent to his widow.

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ENGINEERING

All-Wheel-Drive Tractor Receives U. S. Patent

➤ A FOUR-WHEEL-DRIVE tractor that steers with its rear wheels, so that each rear wheel always follows exactly in the track made by its fore wheel, is the interesting farm machine on which Leon Champion of Marne, Mich., has taken out patent 2,349,141.

In Mr. Champion's tractor the engine is forward, as in conventional designs. The transmission gear box is directly over the center of the chassis, with a multiple chain drive to the master gear of the two drive shafts. The forward wheels, being fixed, offer no particular novelty. The rear wheels can be swung through a wide lateral angle, at the end of their pivoted drive shaft, their traverse being controlled through an arc-shaped channel-steel member at the rear of the chassis.

The inventor states that this tractor can be built out of standard automobile parts, even from "obsoleted" cars.

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CHEMISTRY

Nylon Cords Stick Firmly to Rubber Under New Process

➤ NYLON and rubber would appear to be a "natural" mating for the making of stronger, more durable tires, conveyors, power belts and the like, because of nylon's high tensile strength, elasticity and resistance to flexing. Like many such matches, however, it doesn't come off very well; untreated nylon sticks to rubber less than half as well as cotton cord, when subjected to the strains and stresses of everyday hard use.

To bring about a closer and more enduring union, Dwight L. Loughborough of Akron, Ohio, has worked out a quite simple chemical treatment, on which he has just been granted U. S. patent 2,349,290. First, he softens up the nylon cord in any chemical known to be a good nylon solvent—cresol in alcohol is one example he mentions. After wringing out the excess liquid, he immerses the cord in natural latex or other liquid preparation of rubber. Then the nylon is ready for bonding into the solid rubber, with less likelihood of subsequent trouble and an early separation.

Rights in the patent have been assigned to the B. F. Goodrich Company.

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ENGINEERING

Tough, Easily Portable Movie Projector Wanted

➤ TOUGH, easily portable, 16-millimeter motion picture projectors for the armed services are expected from new specifications just announced by the American Standards Association. They were prepared in cooperation with the Army and Navy and the War Production Board.

Projectors built to these specifications will give a performance, it is expected, that will compare favorably in image and sound with the 35-millimeter projectors used in movie houses. The complete instrument can be packed in three 56-pound cases and can go almost anywhere a soldier can go. It is usable for audiences of as many as 300 soldiers.

This proposed projector is easily serviced in the field, has easily changeable lenses, tubes and other parts, and is as foolproof in operation as possible. It is made of materials and so constructed that it will withstand climatic conditions as well as rough handling.

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PSYCHOLOGY

Night Horrors

Soldiers whose nerves are being battered by the terrors of night combat in Europe have been hardened to it by special course of training.

By FREMONT DAVIS

➤ HERE IS A LETTER that might well have been written by a GI while he was at the Quartermaster Replacement Training Center in training for the big push in muddy Europe. It would be addressed to

Dear Dad:

Camp Lee, Va.—Tonight after supper we were surprised to receive orders to dress in class X fatigues. These are the clothes worn here when very rough work is to be done. They are reissued clothing and it dosn't matter much what happens to them. We are all wondering what we are going to do that requires class X fatigues.

My buddies and I assemble and start on a march. It is a dark night. We march through deep gloom into groves of pine trees. Dark figures stand against the lighter shade of sky. We walk unseen and unheard.

Our captain stops us and a few men disappear into the pine grove. We are allowed to talk now and the tension is eased. Rumors fly. Some say we have a new kind of night problem to work; some try to scare us, but most men are talking about their next furlough.

Our sergeant is now taking the first man aside and directing him down a path, "into the valley of the shadow of death." Soon I follow. I am alone now. I remember the sergeant's order that I am not to talk but to go forward as quickly as possible. The alone feeling is enough in itself to make a person's mind think of horrors and dread even the familiar rustle of leaves. A body-shaking concussion startles my whole being, and I automatically fall to the ground and begin to crawl into a dark muddy trench.

Bang! Crash! What had been gloomy silence was split by thunderous machine gun and shell-fire interspersed with the shrill scream of diving airplanes, and the more distant thunder of bombs. My hands sink deep into mud. All around is the odor of decayed flesh; a stench unfit to breathe; but breathe it I must, and go on, for those are the orders. I have to crawl and creep or bump my head on rails closely spaced above the trench. I push aside the slime as I crawl under these rails.

At the moment, I am lost. I am all alone. The shell-fire and the flashing explosions still shake me and ring in my ears. I am lost in a maze. I feel a hole through which I can crawl at one end so I go through it, only to be lost in a new compartment. My groping in this compartment is leading me into a trench of slime and ooze. I am rolling down a hill into a shell hole half full of water. Water is dripping down my back and I am wet to the skin. Now I see the reason for class X fatigues tonight. That bad odor is still strong. The blast and shell-fire do not stop, but I am becoming less aware of the noises and more aware of the stench, and the urgent desire to get the hell out of this trench.

I have come up from the soggy shell hole. Dirt and sand blow into my face. A sharp turn of the trench; I climb over the edge of another shell hole, and turn on my back to go under a wire barrier. Now deep into a lower level of the filthy trench I fall, roll and half crawl.

Passage Blocked

I have caught up to someone ahead. But why is he lying perfectly still in the way? With shellfire, and a stronger stench than I have smelled before filling my senses, I am forced to simply wait. The orders are not to talk. I wish he would go on. I feel someone shaking my foot, and from behind I hear a whisper, "Go on. Go on." I reach forward to shake the foot of the man in front of me, and start to whisper, "Go—" when a putrid smelling foot falls off in my hand. Shuddering, I drop the foot and slither past the foul-smelling body.

Terror chases me on into a tunnel

CAMP LEE MUD—This soldier may now be in Europe sampling the mud there. Wherever he is, the unpleasantness and horrors of night combat will not be entirely new to him.

where a complete enclosure allows no light to see by, and very little fresh air to breathe. I crawl miles to the end of this tunnel, where I am told to stand up and proceed along the path where I am to await further instructions. Truly I feel I have returned from "the valley of the shadow of death, and I shall fear no evil."

I liked this course, Dad. While I was on it, there were some disagreeable moments, but it makes me realize that my training here has made me tough.

Learned To Crawl

In our first 13 weeks, we learned to crawl and to creep so that almost any obstacle can be gotten over without injury. We know what shell-fire is because we have gone through courses where explosions and the rattling of live ammunition close to our heads is common procedure. We have even had night patrols, and problems to solve on our own. It is hard to lose us at night now and we have little fear of the dark. As a matter of fact, darkness is an old friend. It provides cover and makes traveling at night somewhat easier and safer than over the same ground in the day time.

We have even learned to see at night. If you want to see something at night, you don't look directly at it, but to one side or above or below it. You look at it out of the side of your eye. What you see is not as clear as it would be in the daytime, but you get a pretty good idea of what it might be.

The new thing about this training is that your mind and all your senses are filled with the unexpected and the horrible. It is really made to condition our nerves so that when we go overseas and come against the horrors of combat, we will be ready for them.

Your Son.

Idea From Ft. Benning

The course that our quartermaster soldier has just gone through was designed by Capt. Robert R. Washburn of the 13th Regiment, Quartermaster Replacement Training Corps at Camp Lee, Virginia. He got the idea from a 10-foot-square room used to train officers at Ft. Benning, Georgia, a few years ago. Here an officer was required to write a message and transmit it while wind blew in his face, rain poured through the roof and loud noises disturbed his physical and mental balance.

The 275-yard trench adaptation of the little room is being used with the hope of hardening men's nerves to the horrors of war. The noise along the trench is produced by a sound truck blaring out recordings and by fire crackers dropped into tin barrels to give a very realistic impression of close explosions of shells.

Men pour water down the backs of the subjects as they crawl through the trench, and blow sand and dirt over them. The stench is produced by putrescine, a ptomaine which is formed when flesh decays. The foot came from a dummy placed in the way of the men as they crawled through. The dummy is saturated with the decaying flesh odor so that the men get the feeling that they are crawling over a long-exposed corpse. There is no way of escaping the horrors of a fully simulated war.

The men go through the course after they have had their basic and technical training. There is a pause in their instruction at this point to allow arrangements to be made for the next phase of their training, which is a rather extensive field problem. The interim had been

Do You Know?

Some *alpacas* in the Andes have wool reaching to the ground.

One railroad system salvaged over 1,000,000 pounds of *discarded paper* on its trains in one year.

The demand for Brazilian *quartz crystals* for electric equipment is now 50 times as great as before the war.

Felt, by a secret English development, is now processed to permit its use as a substitute for rubber for insulations, packing, gaskets, shock absorbers, and chair cushions.

Cosmetics now have a government definition: "All products intended to be applied to the human body for cleansing, beautifying, promoting attractiveness, or altering appearance."

Mexico City, now one of America's busiest air travel centers because of increased inter-American air transportation, is constructing a modern *airport* about twice the size of New York's LaGuardia Field.

New Pan-American *tomato,* developed by the U. S. Department of Agriculture, is practically immune to fusarium wilt and resistant to nailhead spot; it is a cross between a wilt-resistant North American variety and the wild currant tomato of the Andes.

Dates, grown mostly in California and Arizona, are now supplying about one-third of the American demand; until recent years the principal supply came from Iraq, and some from Iran, China and other eastern countries.

ITALIAN MUD—This official Signal Corps photograph shows how soldiers in a combat area in Europe must sleep in rain and close to mud.

PUBLIC HEALTH

11% Gonorrhea Increase

➤ AN 11% INCREASE in reported cases of gonorrhea among civilians, for which self-treatment with sulfa drugs receives some of the blame, is announced by the U. S. Public Health Service through the Office of War Information.

A "significant loss" of production and efficiency in industry results from gonorrhea and syphilis, though its exact extent is not known, Surgeon General Thomas Parran declared in a statement accompanying the report.

The increase in gonorrhea was learned from reports of state health officers covering the period from July, 1943, through December, 1943, and represented the increase over new cases reported during the same period for the previous year.

New reported cases of syphilis declined 16% in the same period, though preliminary figures from some states indicate a definite increase in reported cases of infectious syphilis in the age group 14 to 24.

Gonorrhea occurs at least three times more often than syphilis, health authorities estimate.

"The upward trend in gonorrhea infections among civilians is heightened," the report states, "by the widespread use of sulfa drugs in attempted self-treatment.

"Rarely is cure effected, but external symptoms may disappear and thousands of individuals consider themselves cured, with disastrous results for themselves and the communities in which they remain sources of infection."

Many gonorrhea sufferers, health officials say, are getting sulfa drugs over drugstore counters, especially in the southern and eastern states, without a doctor's prescription.

An increased number of public health clinics, additional hospitals for rapid treatment of venereal disease, distribution of larger quantities of free drugs to private physicians, intensive research in rapid treatment methods using sulfa drugs, arsenicals and penicillin, expansion of case-finding personnel and a national campaign of education are the weapons the federal and state health agencies and industry will use in 1944 to fight the threat of venereal disease.

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filled with less intensive work not particularly adapted to the best training of men destined to take part in the worst of wars. This course is filling the gap with realistic training.

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NUTRITION

NATURE RAMBLINGS

by Frank Thone

Food and Latitude

➤ RABBIT is rather generally esteemed as choice meat, here in the comfortable temperate zone. But go far enough north, and rabbit becomes less desirable than owl, which most of us would never knowingly eat at all.

The key to this seeming paradox is found in the necessity for having as much fat as possible in one's diet, in the cold lands of the High North. In *Survival,* a handy little pocket manual produced by the Army Air Forces for the use of aviators forced down in out-of-the-way places, the first word in the section on food in the Arctic is, "Eat as much fat as you can." A little farther along: "Because of the importance of fats, under no conditions limit yourself to a meat diet of rabbit just because they happen to be plentiful in the region where you are forced down. Rabbits are generally so lean that in order to get enough energy out of them you have to eat a little too much for comfort." Then, after a recommendation of ducks, geese and swans as good, fat birds, which sounds familiar enough and therefore quite acceptable, a good word is said for the great white owl of the Arctic as "usually fat and tasty."

In general, flyers grounded in the Arctic must feed like Eskimos, mainly on meat. Even in summer this is true, and in winter practically nothing but meat is obtainable. If you have firearms, the manual advises, you can kill even the largest of Arctic animals — caribou, muskox, seal, walrus. Little use, though, to shoot a white bear—the flesh is usually tough and the liver is poisonous.

Flyers downed in tropical jungles, on the other hand, will live largely on vegetables, simply because they have to. There aren't many animals in most tropical wildernesses, especially in island jungles. On many of the smaller Pacific islands, over which our air forces are now operating, there aren't even monkeys. Lizards and snakes are good eating, if you can get them, even though most of us would relish them as little as we would a "fat and tasty" owl.

One considerable problem, in living off the country in the tropics, is learning to steer clear of poisonous plants that look most attractive and appetizing. There aren't very many really dangerous plant species, but there is no simple rule-of-thumb way of knowing them, any more than there is a silver-spoon test for poisonous mushrooms. One simply has to learn what they look like, species by species, sandbox and manzanillo and strychnos and so on; but these few simple lessons in botany are worth the learning, for they may some day pay off in terms of life itself.

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Dwarf *apple trees* on city lots may become common soon as a result of the successful experimental grafting of 40 American varieties on 14 types of the English malling rootstocks.

MEDICINE

Insulin in Nazi Field Kit

From damaged pieces of German medicine chests, enough has been collected to compare their equipment with our own. Contain more drugs.

➤ ARE THE NAZIS scraping so near the bottom of their manpower barrel they are taking diabetics into the army? The question is raised by the presence of insulin in the German army field medicine chest displayed with other captured enemy equipment at the Weapons of War Exhibit presented by the Army Service Forces in Washington, D. C.

Under the Geneva convention, medical equipment cannot be taken from the enemy but is left with captured prisoners of war for their use. From damaged pieces found, however, enough has been collected to compare what the Germans and Japs use with our own excellent medical and surgical supplies and equipment.

The insulin may mean diabetics in the Nazi army or its presence may be merely another example of German thoroughness. This last is suggested by the very large number of drugs in their field medicine chest, many more than contained in the U. S. Army field medicine chest. U. S. Army medical officers do not need to take so many drugs with them into the forward area because our evacuation of the sick and wounded to fully equipped hospitals in the rear is so swift.

American medical officers were much amused by one item in the Nazi field medical chest, a serum for immunizing against gonorrhea.

Prontosil, first of the sulfa drugs, and sulfapyridine are in the chest, as are many standard items one would expect to find. Many of the drugs have only their trade names and dosage on the label, with no other sign of what they are.

The Nazis had no lack of metal at the time, said to have been no earlier than 1939, when this particular chest was packed, judging from the large number of drugs in tin boxes. Very many of the medicines, almost all, are put up in ampules of individual doses. While this saves time when giving the medicine, it takes more time in packaging and the fragile ampules require more care in transportation.

German medical equipment, although much of it is good, tends to be "gadgety" and complex in organization. Surgical instruments, for example, are packed in trays in a box. Each instrument is numbered and so is its place in the tray. The advantages of this are that the surgeon can easily find the instrument he wants and that the entire trayful can be sterilized and be ready for use as soon as taken from the sterilizer and cooled. The disadvantage is that if a surgeon uses only a few of the instruments from a tray for an operation, the entire lot must be resterilized before any of them can be used, thus putting many of them out of service at a time when they might be urgently needed.

U. S. Army surgical instruments for field use are packed in cloth rolls. Apparently our Army medical officers have a great many more instruments at their command. In one Nazi chest with six trayfuls of instruments there are only 30 artery clamps. This seems a small number, since as many as 15 may be used to control bleeding points during a single operation.

The Jap medicine chest on exhibit came from Attu and was so water-soaked that the labels could not be read. Its arrangement, however, seemed to follow closely that of the Nazis and the surgical equipment seemed much the same.

Nazi field dental equipment is scanty and inferior. The "engine" to which the dentist attaches his drills is foot-driven, whereas those in the U. S. Army's handsome mobile dental unit are electrically powered. This mobile dental unit looks like an Army truck on the outside, but inside is a gleaming white dentist's offic with equipment for taking care of every dental need from filling an aching cavity to making false teeth.

Very poor by comparison with ours are the Nazi leg splints. They have no padding, which is a serious defect, and are made of metal tubes which, though carefully made with welded joints, would be useless if bent in transport.

The Nazi field cot looks rickety but is said to be sturdy and comfortable. It has the disadvantage of a many-jointed wooden frame which would be completely useless if one of the joints broke in handling, as they easily might.

Nazi and Jap rations displayed look most unappetizing as well as monotonous, though U. S. Quartermaster Corps officers at the exhibit said they are nourishing. The Jap rations are said to consist of rice, rice cakes, tea, a vitimin tablet and cans of fish and fish liver. The German rations on exhibit were three kinds of messy-looking stews.

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• First Glances at New Books •

➤ PLANES AND BLIMPS, engines and superchargers; bombs, guns and cannon; organization, aerology, navigation—these are only a sample few of the many subjects packed into a not-very-large book, A GUIDE TO NAVAL AVIATION, (*McGraw-Hill*, $2.50) by Lt. W. W. Elton, Lt. A. H. Driscoll, Lt. R. H. Burchmore and Lt. G. B. Larkum, all instructors at the U. S. Naval Air Station at Quonset Point, R. I.

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➤ PLASTICS, lacquers and all the other bright stuffs that present dreams of the post-war world are made of are themselves made to a very considerable extent of cellulose. If these dreams are to be realized there must be chemists, and if there are to be chemists they must be taught. For this purpose a new and up-to-date text, Emil Heuser's THE CHEMISTRY OF CELLULOSE (*Wiley*, $7.50) is well adapted.

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➤ BIOLOGY as a study of the reactions and functions of living organisms is an ideal held up to all teachers of the subject; obstacles to its realization have been many of the older textbooks, which too often have been merely combinations of zoology and botany. A conscious and direct approach along the definitely biological path is made in BIOLOGY AND MAN, by Benjamin C. Gruenberg and N. Eldred Bingham (*Ginn*, $2.24).

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➤ EVOLUTION of soil, through slow geologic ages, its quick ruin through erosion-encouraging abuse, its salvation through conservation measures, are woven into a story of few words (and those most tellingly simple ones) and many pictures in THE LAND WE LIVE ON, by Carroll Lane Fenton and Mildred Adams Fenton (*Doubleday Doran*, $2.50). The book can be read with understanding by young children, with pleasure by adults.

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➤ PERSONAL report of history-in-the-making is presented in TEN YEARS IN JAPAN by Joseph C. Grew, United States Ambassador to Japan from 1932 to 1942 (*Simon and Schuster*, $3.75). Drawing upon his day-to-day diaries, personal and official correspondence, and dispatches to the State Department, Ambassador Grew paints a living story of how and why our country and Japan are at war. Always striving to interpret the United States and Japan each to the other, his report of the years prior to Pearl Harbor goes far in explaining the Japanese people and their civilization to his readers.

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➤ FROM ACCENTOR to yellow-throat, hundreds of species and varieties of birds are briefly but sufficiently described, compactly illustrated, in L. A. Hausman's ILLUSTRATED ENCYCLOPEDIA OF AMERICAN BIRDS (*Halcyon House*, $1.98). At this bargain price, no ornithologist need be without a good book in which he can "look up" for quick reference any bird whose name he knows.

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➤ IN TVA: DEMOCRACY ON THE MARCH, (*Harper*, $2.50) Chairman David E. Lilienthal tells the story of this first great adventure in the planned and correlated use of the major resources of an important geographic region. He pleads for a chance for "dreamers with shovels" to continue and extend the mode of operation for which the Valley has been a proving-ground.

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Just Off the Press

ATOMS IN ACTION, The World of Creative Physics—George Russell Harrison—*Garden City*, Rev. ed. 401 p., illus., $1.49.

BASIC MATHEMATICS FOR ENGINEERS—Paul G. Andres, Hugh J. Miser and Haim Reingold—*Wiley*, 726 p., $4.

BOMBERS—Keith Ayling—*Crowell*, 194 p., illus., $2.50.

BUGS AND BULLETS—J. Breckinridge Bayne—*Richard R. Smith*, 256 p., illus., $2.75.

CONSERVATION IN THE UNITED STATES, 2nd ed.—A. F. Gustafson, C. H. Guise, W. J. Hamilton, Jr., and H. Ries—*Comstock*, 477 p., illus., $4. In preparing a new edition of this successful college text, the authors have made full use of conservation lessons emphasized by the war.

THE CONTROL OF CROSS INFECTION IN HOSPITALS—Sub-Committee on Cross Infection in Hospital Wards—*Brit. Info. Services*, 34 p., paper, 15c. Medical Research Council War Memo. No. 11 Code No. 45-9-11.

ENCYCLOPEDIA FOR BOYS AND GIRLS, A Modern Reference Book—S. Johnson—*Phil. Library*, 396 p., illus., $3.

FAMINE (Quaker Work in Russia 1921-23)—Michael Asquith—*Oxford Univ.*, 70 p., paper, 75c.

INDEX FOSSILS OF NORTH AMERICA—Hervey W. Shimer and Robert R. Shrock—*Wiley*, 837 p., illus., $20.

THE MANAGEMENT OF NEUROSYPHILIS—Bernhard Dattner and others—*Grune & Stratton*, 398 p., $5.50.

MICROFILMING—Ralph De Sola—*Essential Books*, 258 p., illus., $1.50.

NAVY IN THE SKY—Wallace W. Elton—*Whittlesey House*, 104 p., illus., $2. A picture book of naval aviation.

ONE HUNDRED YEARS OF AMERICAN PSYCHIATRY—J. K. Hall and others, eds.—*Columbia Univ. Press*, 649 p., illus. $6.

ROMAN TOWNS, Photographs and Text—Ernest Nash—*J. J. Augustin*, 201 p., illus., $6. Good descriptions of Roman archaeology, with a wealth of excellent photographic illustrations. There is something at once melancholy and grim in the inevitable reflection upon the harsh efficiency of modern methods in mass-producing still more ruins.

TABLES OF LAGRANGIAN INTERPOLATION COEFFICIENTS—Prepared by Mathematical Tables Project, W. P. A.—*Columbia Univ. Press*, 394 p., $5.

THE USE OF PENICILLIN IN TREATING WAR WOUNDS—Penicillin Clinical Trials Committee—*Brit. Info. Services*, 16 p., paper, 10c. Medical Research Council War Memo. No. 12. Code No. 45-9999.

WOOD AIRCRAFT INSPECTION AND FABRICATION — Army-Navy-Civil Committee—*Gov't Printing Off.* 364 p., illus., paper, $1. ANC bulletin.

WORLD WIDE PLANISPHERE—Wm. H. Barton, Jr.—*Addison Wesley*, 14 p., charts, $2.50. Tables and charts for finding and identifying constellations and the 55 navigational stars from all latitudes, north and south, throughout the year.

YOUR EYES—Sidney A. Fox—*Knopf*—191 p., $2.75. Price correction.

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•New Machines and Gadgets•

⚙ *AIRCRAFT smoke detectors warn pilots of fire in the cargo space of a plane. Blowers send air constantly through a small cabinet where smoke particles, if present, automatically actuate the delicate mechanism which sets off the alarm.*

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⚙ *TEMPERATURE - INDICATING nursing or other bottle, recently patented, has an elongated depression on one side into which a thermometer is permanently fixed and covered with glass or a transparent plastic. Washing or sterilization does not injure the inset.*

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⚙ *SWEAT BOXES for patients requiring sweat baths permit treatment while the person is in a reclining position. This newly patented device provides for the admission of fresh oxygen to the patient as fast as needed, and for the removal of body gases thrown off by the skin. It can be collapsed for storage.*

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⚙ *AUTOMOBILE BED leaves the front seat undisturbed, using the rear of the car for sleeping space. The rear seat cushion, in this patented arrangement, slides forward, the back swings up out of the way, a supplementary pad covers the seat space, and a pad in the baggage compartment makes the rest of the bed.*

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⚙ *NEW FIELD PACK for American soldiers is designed to replace the old Army haversack. The rear view in the photograph shows various compartments closed by straps, zippers, or snaps. Shoulder and body straps hold it in place.*

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⚙ *USED METAL bottle caps are reshaped ready for use again by a machine just patented into which they are automatically fed and which marks each cap so that the number of times it is reshaped and reused is indicated. It is said to be simple, efficient and automatic in operation.*

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⚙ *SEWING KIT, recently patented, is a tube with an enlarged hollow head suitably shaped to serve as a hosiery darning egg. The unscrewed top of the head reveals spaces for needles, a thimble and several balls of thread or yarn.*

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⚙ *LEAK-PROOF DRY-CELL, for which a patent has been issued, uses a thermoplastic material for an outer coating placed directly on the zinc electrode. No other insulating material is needed, as the plastic is electrically non-conductive.*

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If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, *1719 N St., N. W., Washington 6, D. C., and ask for Gadget Bulletin 210.*

Question Box

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